

AMENDMENTS TO THE DRAWINGS

New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the drawings were declared to be informal in the transmittal letter filed December 16, 2003.

Attached are four replacement drawing sheets for Figs. 1-4. The replacement sheets are submitted to correct informalities in the original drawings submitted December 16, 2003.

Subject to the approval of the Examiner, it is respectfully requested that the attached drawing sheets be substituted for the originally filed drawing sheets for Figs. 1-4.

Attachment: Replacement sheets 1-4.

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REMARKS

The above Amendments and these Remarks are in reply to the Office Action mailed August 15, 2005. A Petition for Extension of Time is submitted herewith.

I. Summary of Examiner's Rejections

Claims 1-60 were pending in the Application prior to the outstanding Office Action. In the Office Action, Claims 1-60 were rejected. Claims 1-60 were rejected under 35 U.S.C. § 101 as allegedly the claimed invention is directed to non-statutory subject matter. Claims 15, 20, 35, 40, 55 and 60 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1, 2, 5-7, 10-12, 15-17, 20-22, 25-27, 30-32, 35-37, 40-42, 45-47, 50-52, 55-57 and 60 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Kawahara (U.S. Patent Application Publication 2002/0161816 A1). Claims 3, 4, 8, 9, 13, 14, 18, 19, 23, 24, 28, 29, 33, 34, 38, 39, 43, 44, 48, 49, 53, 54, 58 and 59 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kawahara (U.S. Patent Application Publication 2002/0161816 A1) in view of Applicant's Admitted Prior Art (APA).

II. Summary of Applicant's Amendments

The present Response amends Claims 1, 5, 6, 10, 11, 15, 16, 20, 21, 25, 26, 30, 31, 35, 36, 40, 41, 45, 46, 50, 51, 55, 56 and 60, leaving for the Examiner's present consideration of Claims 1-60. Reconsideration of the claims in light of the following arguments is respectfully requested.

III. Claims Rejected Under 35 U.S.C. § 101

Claims 1-60 are rejected under 35 U.S.C. § 101 as allegedly the claimed invention is directed to non-statutory subject matter.

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Claims 41-60

Claims 41-60 detail a computer medium including instructions stored thereon which when executed cause the computer to perform steps. It was stated that the Specification on page 9, lines 4-5, is directed to non-statutory subject matter such as signals and waves. Paragraph 0020 of the specification has been amended to remove the term *media* as shown in detail above, as media includes signals and waves.

In addition, it was stated that the cited claims do not definitively state that the instructions are executed on the computer to perform the steps. Thus, independent Claims 41, 46, 51 and 56 have been amended to require execution *by one or more processors on the computer*.

Regarding the Specification, Applicant respectfully submits that with the proposed amendment to the Specification, the claimed invention is now directed to statutory subject matter. Applicant respectfully submits that with the amendment to independent Claims 41, 46, 51 and 46, Claims 41-60 now are directed to software code that is tangible and therefore statutory. Reconsideration of Claims 41-60 is respectfully requested.

Claims 1-20

Claims 1-20 detail a system for stopping threads in a safe state having a plurality of threads and a native code interpreter configured to stop executing the thread. It was stated that the Specification on page 7, paragraph 0015, details examples of what the system *may* comprise of. Paragraph 0015 of the Specification has been amended to substitute the term *comprises* for one reference to the term *may be*, as well as to delete two other references to the term *may be*, as shown in detail above.

In addition, it was stated that the cited claims have no definitive language that the system comprises any hardware or tangible component to perform the steps or execute software defined in the claims. Independent claims 1, 6, 11, and 16 have been amended to require a system *run on one or more processors*.

Regarding the Specification, Applicant respectfully submits that with the proposed amendments to the Specification, the claimed invention is now directed to statutory subject

matter. Applicant respectfully submits that with the amendment to independent Claims 1, 6, 11 and 16, Claims 1-20 are now directed to a system that comprises a hardware or tangible component, and thus Claims 1-20 are statutory. Reconsideration of Claims 1-20 is respectfully requested.

Claims 21-40

Claims 21-40 detail a method for stopping threads in a safe state in a run time environment. It was stated that the cited claims have no definitive language that the system comprises any hardware or tangible component to perform the steps or execute software defined in the claims. Independent claims 21, 26, 31, and 36 have been amended to require a system *run on one or more processors*.

Applicant respectfully submits that with the amendment to independent Claims 21, 26, 31 and 36, Claims 21-40 are now directed to a system that comprises a hardware or tangible component, and thus Claims 21-40 are statutory. Reconsideration of Claims 21-40 is respectfully requested.

IV. Drawings

In the Office Action mailed August 15, 2005, new corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the drawings were declared to be informal in the transmittal letter filed December 16, 2003. Applicant respectfully submits that the four replacement drawings attached herewith correct informalities in the original drawings submitted December 16, 2003.

V. Claims Rejected Under 35 U.S.C. § 112

Claims 15, 20, 35, 40, 55 and 60 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 15, 20, 35, 40, 55 and 60

In the Office Action, it was stated that Claims 15, 20, 35, 40, 55 and 60 included the term "that information," and that it is not clear as to what information is provided to the system. These claims have been amended to replace the term "that information" with "interpreted machine code information" in order to correct any indefiniteness. It was also stated that it can be inferred that Applicant is probably alluding to the executing thread as the second thread, but the claims do not definitively illustrate this. These claims have been amended to replace "executing thread" with "executing second thread" in order to correct any indefiniteness. Applicant respectfully submits that Claims 15, 20, 35, 40, 55 and 60 as amended now properly conform to the requirements of 35 U.S.C. § 112, and reconsideration thereof is respectfully requested.

Claims 5, 10, 25, 30, 45 and 50

Although these claims were not rejected under 35 U.S.C. § 112, these claims require the same embodiments as Claims 15, 20, 35, 40, 55 and 60. Thus, Claims 5, 10, 25, 30, 45 and 50 have also been amended in the same manner as Claims 15, 20, 35, 40, 55 and 60 in order to preclude any future 35 U.S.C. § 112 rejections.

VI. Claims Rejected Under 35 U.S.C. § 102

Claims 1, 2, 5-7, 10-12, 15-17, 20-22, 25-27, 30-32, 35-37, 40-42, 45-47, 50-52, 55-57 and 60 are rejected under 35 U.S.C. § 102(e) as allegedly being anticipated by Kawahara (U.S. Patent Application Publication 2002/0161816 A1). Applicant respectfully traverses the rejection by demonstrating below that Kawahara does not anticipate the applicant's invention.

Claim 21

Kawahara discloses clean thread termination in a Java language execution system. (p 1, para 0005). Kawahara discloses that methods therein are implemented in an interpretive loop, executing in a language that is interpreted. (p 2, para 0021). The interpreter loop in the Java computing environment is a component of the Java Virtual Machine. It (the interpreter) takes in Java bytecodes and *interprets or executes the bytecodes* one by one. (p 3, para 0029). The

interpreter loop determines whether the code being executed by the thread that is to be terminated belongs to the user program. (p 3, para 0029).

Kawahara discloses a thread, such as thread 104 or 106 that is executing normally in a process. (p 3, para 0027). The thread is notified of termination by execution of a modified Thread.stop() command, and this command is typically received from another thread. (p 3, para 0027). When a modified Thread.stop command is received by a thread, a *termination flag* in field 116 in data structure 108 is set to one. (p 3, para 0028). Fig. 4A shows a process of cleanly and forcibly terminating a thread in an interpreter loop. At step 404, the interpreter loop checks the termination flag of the thread that is currently executing the interpreter loop. (p. 3, para 0029). If the flag is set, in step 406, the interpreter loop determines whether the code being executed by the thread that is to be terminated belongs to the user program. If so, in step 408 an *exception flag* is set to indicate thread termination, meaning that the thread is in a safe state to be terminated. (p 3, para 0029). If in step 410, the *exception flag* is not set, control goes back to step 402, where the *interpreter loop continues to execute the next byte code*. (p 3, para 0030. Thus, even when a termination flag is set by a first thread to stop a second thread, the second thread is not stopped until the exception flag is set, meaning that the second thread continues to execute until it is in a safe state.

Claim 21 is an independent method claim and has been amended to correct a typographical error. Claim 21 has also been amended to require a *native code interpreter* which is configured to stop execution of an executing thread such that the *executing thread is stopped*, and the native code interpreter interprets machine code to determine if the executing thread is in a safe state, and wherein *if the executing thread is not in a safe state, the native code interpreter moves the executing thread forward in steps* and at each step determines the state until the executing thread is finally stopped in a safe state.

Claim 21 requires a *native code interpreter*. Native code, also known as machine code or machine language, is a system of codes directly understandable by a computer's CPU. (Wikipedia). The *interpreter loop* in Kawahara, on the other hand, takes in *Java bytecodes* and determines whether the code being executed by the thread belongs to the user program. (p 3, para 0029). Thus, Kawahara does not disclose or suggest a native code interpreter.

Further, Fig. 3 of the present invention shows that after thread B (the stopping thread) requests that thread A (the executing thread) be stopped, *thread A is stopped*. (Spec., p 7, lines

23-24). If thread A is not in a safe state, thread B is allowed to roll forward thread A using a *machine code interpretation* 46 of thread A's current state. (Spec. p 7, lines 25-26). Thread A is subsequently *rolled forward in discrete steps* (indicated by arrows 48, 50 and 52 respectively), until thread A is found to be in a safe state. (Spec. p 6, line 26 – p7, lines 1-4). In Kawahara, as discussed above, even when a termination flag is set by a first thread to stop a second thread, the second thread is not stopped until the exception flag is set, meaning that the *second thread continues to execute until it is in a safe state*. Also, as discussed above, Kawahara does not teach a native code interpreter. Thus, Kawahara does not teach stopping execution of an executing thread such that the *executing thread is stopped*, wherein the technique of stopping includes that the native code interpreter interprets machine code to determine if the executing thread is in a safe state, and wherein *if the executing thread is not in a safe state, the native code interpreter moves the executing thread forward in steps* and at each step determines the state until the executing thread is finally stopped in a safe state, as required by Claim 21.

Further, the present invention does not use the *termination flag* and *exception flag* disclosed in Kawahara. The termination flag and exception flag of Kawahara, used in combination, allow a thread to run until it is in a safe state. The background section of the Specification for the present invention refers to the similar use of *flags* for thread termination as used in the prior art. In particular, some vendors have tried to stop threads in a safe state prior to context switching by incorporating a state flag within each thread. (Spec., p 3, lines 7-9). For example, operating systems such as Solaris and Linux use a state flag to indicate whether the thread is in a non-switchable (not safe) state. (Spec., p 3, lines 9-11). If the state flag indicated the thread is in a non-switchable state the *system resumes thread execution and retries again at a later point in time*. Unlike Kawahara and the prior art in the background of the Specification, the present invention *stops the executing thread*, and the native code interpreter interprets machine code to determine if the executing thread is in a safe state, and wherein *if the executing thread is not in a safe state, the native code interpreter moves the executing thread forward in steps* and at each step determines the state until the executing thread is finally stopped in a safe state, as discussed above for Fig. 3 and as required by Claim 21.

Thus, Kawahara does not disclose or suggest a *native code interpreter* which is configured to stop execution of an executing thread such that the *executing thread is stopped*, and the native code interpreter interprets machine code to determine if the executing thread is in a safe state, and wherein *if the executing thread is not in a safe state, the native code interpreter moves the executing thread forward in steps* and at each step determines the state until the executing thread is finally stopped in a safe state, as required by Claim 21. For at least these reasons, Kawahara does not anticipate Claim 21. Applicant respectfully requests reconsideration of this claims.

Claims 1 and 41

Claims 1 and 41 are independent system and computer readable medium claims, respectively. These claims have been amended to correct a typographical error and have also been amended to require a *native code interpreter* which is configured to stop execution of an executing thread such that the *executing thread is stopped*, and the native code interpreter interprets machine code to determine if the executing thread is in a safe state, and wherein *if the executing thread is not in a safe state, the native code interpreter moves the executing thread forward in steps* and at each step determines the state until the executing thread is finally stopped in a safe state. The comments provided above with respect to Claim 21 are hereby incorporated by reference, as Claims 1 and 41 require the same embodiments as method Claim 21. As discussed above for Claim 21, Kawahara does not disclose or suggest the embodiments of Claim 21 and as required by Claims 1 and 41. For at least these reasons, Kawahara does not anticipate Claims 1 and 41. Applicant respectfully requests reconsideration of these claims.

Claim 6, 26 and 46

Claim 6, 26 and 46 are independent system, method and computer readable medium claims, respectively. Claims 6, 26 and 46 have been amended to require that the *executing thread is stopped*, and the native code interpreter interprets machine code to determine if the executing thread is in a safe state, and wherein *if the executing thread is not in a safe state, the native code interpreter moves the executing thread forward in steps* and at each step determines the state until the executing thread is finally stopped in a safe state. The comments

provided above with respect to Claim 21 are hereby incorporated by reference. As discussed above for Claim 21, Kawahara does not disclose or suggest embodiments of Claim 21, some of which are required by Claims 6, 26 and 46. For at least these reasons, Kawahara does not anticipate Claims 6, 26 and 46. Applicant respectfully requests reconsideration of these claims.

Claims 11, 31 and 51

Claims 11, 31 and 51 are system, method and computer readable medium independent claims, respectively. Claims 11, 31 and 51 have been amended to require that the *second thread is stopped*, and the native code interpreter interprets machine code to determine if the second thread is in a safe state, and wherein *if the second thread is not in a safe state, the native code interpreter moves the second thread forward in steps* and at each step determines the state until the second thread is finally stopped in a safe state. The comments provided above with respect to Claim 21 is hereby incorporated by reference. As discussed above for Claim 21, Kawahara does not disclose or suggest the embodiments of Claim 21, some of which are required by Claims 11, 31 and 51. For at least these reasons, Kawahara does not anticipate Claims 11, 31 and 51. Applicant respectfully requests reconsideration of these claims.

Claims 16, 36 and 56

Claims 16, 36 and 56 are system, method and computer readable medium independent claims, respectively. Claims 16, 36 and 56 have been amended to require *if the second thread is not in a safe state, the first thread uses a native code interpreter to move the second thread forward in steps* and at each step to determine the state until the second thread is finally stopped in a safe state. The comments provided above with respect to Claim 21 is hereby incorporated by reference. As discussed above for Claim 21, Kawahara does not disclose or suggest the embodiments of Claim 21, some of which are required by Claims 16, 36 and 56. For at least these reasons, Kawahara does not anticipate Claims 16, 36 and 56. Applicant respectfully requests reconsideration of these claims.

Claims 2, 7, 12, 17, 22, 27, 32, 37, 42, 47, 52 and 57

These claims depend from independent Claims 1, 6, 11, 16, 21, 26, 31, 36, 41, 46, 51 and 56, respectively. These claims are not addressed separately, but it is respectfully submitted that these claims should be allowable as depending from allowable independent claims and further in view of the comments provided above. Applicant respectfully submits that the embodiment as defined in Claims 2, 7, 12, 17, 22, 27, 32, 37, 42, 47, 52 and 57 are not anticipated by Kawahara. Applicant respectfully requests reconsideration of these claims.

Claims 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55 and 60

These claims depend from independent Claims 1, 6, 11, 16, 21, 26, 31, 36, 41, 46, 51 and 56, respectively. The comments provided above with respect to Claims 21 and 26 are hereby incorporated by reference. Claims 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55 and 60 require a *native code interpreter*. As discussed above for Claims 21 and 26, Kawahara does not disclose or suggest a native code interpreter, as required by Claims 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55 and 60. For at least these reasons, Kawahara does not anticipate these claims. Applicant respectfully requests reconsideration of these claims.

VII. Claims Rejected Under 35 U.S.C. § 103

Claims 3, 4, 8, 9, 13, 14, 18, 19, 23, 24, 28, 29, 33, 34, 38, 39, 43, 44, 48, 49, 53, 54, 58 and 59 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kawahara (U.S. Patent Application Publication 2002/0161816 A1) in view of Applicant's Admitted Prior Art (APA).

Claims 3, 4, 8, 9, 13, 14, 18, 19, 23, 24, 28, 29, 33, 34, 38, 39, 43, 44, 48, 49, 53, 54, 58 and 59

These claims depend from independent Claims 1, 1, 6, 6, 11, 11, 16, 16, 21, 21, 26, 26, 31, 31, 36, 36, 41, 41, 46, 46, 51, 51, 56 and 56, respectively. These claims are not addressed separately, but it is respectfully submitted that these claims should be allowable as depending from allowable independent claims and further in view of the comments provided above. Applicant respectfully submits that the embodiment as defined in these dependent claims are neither anticipated by nor obvious in view of Kawahara or Applicant's Admitted Prior Art, taken alone or in combination. Applicant respectfully requests reconsideration of these claims.

VIII. Conclusion

In light of the above, it is respectfully submitted that all of the claims now pending in the subject patent application should be allowable, and a Notice of Allowance is requested. The Examiner is respectfully requested to telephone the undersigned if they can assist in any way in expediting issuance of a patent.

Enclosed is a PETITION FOR EXTENSION OF TIME UNDER 37 C.F.R. § 1.136 for the time up to and including February 15, 2006.

The Commissioner is authorized to charge any underpayment or credit any overpayment to Deposit Account No. 06-1325 for any matter in connection with this response, including any fee for extension of time, which may be required.

Respectfully submitted,

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